



CITY OF GLENDALE, CALIFORNIA REPORT TO THE CITY COUNCIL

AGENDA ITEM

Report: 100% Clean Energy by 2030 Study – Motion to Note and File

1. Motion to note and file 100% Clean Energy by 2030 Study.

COUNCIL ACTION

Item Type: Action Item

Approved for _____ **March 30, 2021** _____ **calendar**

ADMINISTRATIVE ACTION

Submitted by:

Michael E. De Ghetto, Interim General Manager, Glendale Water and Power

Prepared by:

Mark Young, Assistant General Manager/Power
Chie Valdez, Power Planning Manager

Reviewed by:

Michele Flynn, Director of Finance
Michael J. Garcia, City Attorney

Approved by:

Roubik R. Golanian, P.E., City Manager

RECOMMENDATION

Glendale Water & Power (GWP) staff respectfully recommends that the City Council note and file the “100 % Clean Energy By 2030 Report” attached to this Council Report as Exhibit 1.

BACKGROUND/ANALYSIS

On July 23, 2019, Glendale City Council adopted the 2019 Integrated Resource Plan. Integrated Resource Plans, or IRPs, are “electricity system planning document that describe how utilities plan to meet their energy and capacity resource needs, policy goals, physical and operational constraints, and other utility priorities (such as reducing rate impacts on customer bills).” An IRP does not authorize specified actions, but rather, it is a planning document designed to provide Glendale with guidance to establish policies regarding GWP’s electricity supply over the period from January 1, 2019 through December 31, 2030.

The 2019 Integrated Resource Plan, available at <https://www.glendaleca.gov/home/showpublisheddocument?id=51814>, identified a preferred energy supply portfolio that included, among other things, the following resources: (1) a 75 MW/300 megawatt-hour (MWh) battery energy storage system (BESS) of which 50 MW / 200 MWh would be installed in the near term, followed by an additional 25 MW / 100 MWh BESS to be installed in the future; (2) 93 MW of reciprocating internal combustion engine (RICE) generators; and (3) up to 50 MW of clean distributed energy resources. The 2019 IRP adopted by the City Council, and approved by the California Energy Commission, presented a very ambitious clean energy plan that establishes Glendale Water & Power as a clean energy leader.

In addition to adopting the 2019 IRP, the City Council directed GWP staff to report, to Council, the development of a plan for goals or methods to achieve 100% clean energy by 2030 at least 60 days prior to the City Council’s consideration of the purchase of the RICE units. On September 15, 2020, the City Council authorized a Task Order with Ascend Analytics, LLC (Ascend) to evaluate whether Glendale Water & Power can achieve 100% Clean Energy by 2030. The completed report is attached to this staff report as Exhibit 1.

The study was designed to develop a “best case” pathway to maximize the amount of clean energy delivered to Glendale while maintaining high-level of reliability. It is not intended to be a strategic plan but aims to provide an insight into the viability of reaching the state’s goal of 100% Clean Energy by 2045, fifteen (15) years in advance.

Modeling and Results

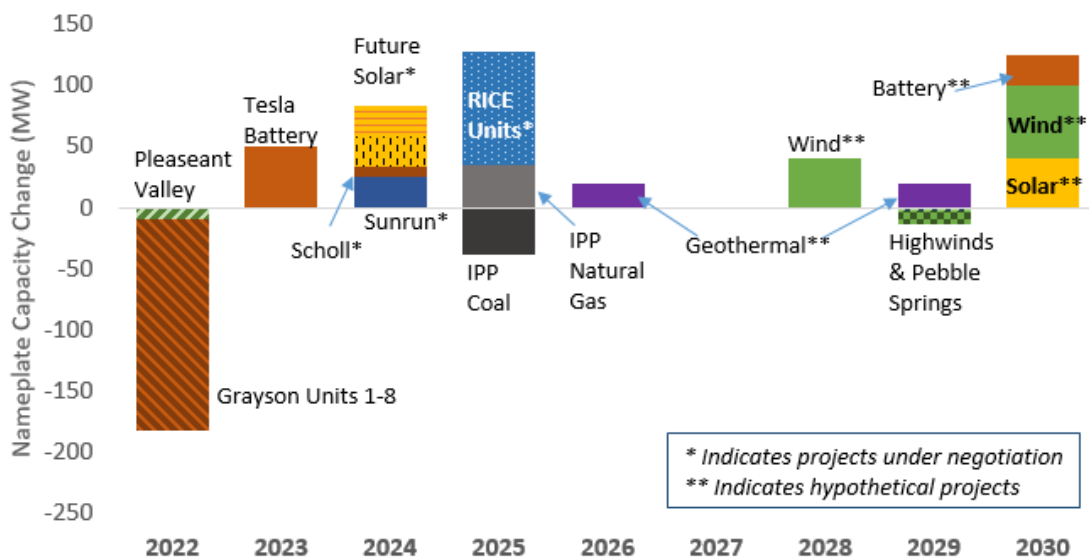
The analysis builds on the assumptions and modeling used for the 2019 adopted IRP, with the recently released CEC Demand Forecast, rescaled with GWP’s actual load and high electric vehicle penetration.

Recently approved projects, including Eland Solar with Battery Energy Storage System (BESS), Whitegrass and Starpeak Geothermal Energy, a SCPPA solar project that is currently under negotiation, as well as updates to Sunrun Virtual Power Plant, were incorporated to the baseline as the new starting point for the model.

Only commercially available technologies such as solar, wind, geothermal and lithium-ion batteries were assessed for consideration in this study. Technologies that could qualify as renewable and zero-carbon resources such as large-scale hydro, nuclear, renewable fuel alternatives (i.e. green hydrogen), and long duration storage were excluded from the model. Although cost of the candidate resource was taken into account in the portfolio buildout, it was not considered a limiting factor.

Using Ascend’s PowerSIMM Software to analyze various scenarios, the optimum portfolio mix assembled implies that the maximum clean energy Glendale can generate locally and bring to the system from outside resources to serve load around-the-clock is approximately 89%, inclusive of 82% from renewable resources. This is well over the state’s goal of 60% renewable by 2030. As a comparison, the 2019 IRP shows Glendale meeting 77% of its energy needs on a net basis with GHG free resources by 2030.

The annual buildout of the considered clean energy portfolio is shown below:



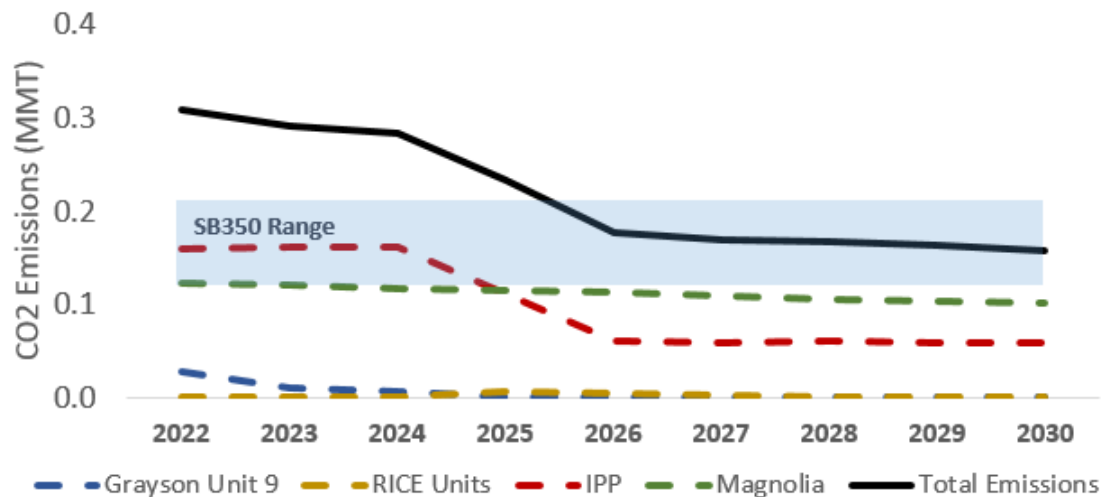
Many of the capacity additions and retirements were already captured in the 2019 IRP. Key changes and assumptions for the best-case-scenario presented in this study, are as follows:

- Grayson Units 1-8 retirement in 2022
- 50MW Tesla Local BESS installed in 2023
- 25MW Eland Solar with BESS, and another 25MW SCPPA Solar with BESS project currently under negotiation coming online in 2024
- 93 MW RICE retained for system reliability
- Repowering of IPP from coal to gas in 2025
- Sunrun VPP fully deployed by 2024
- Scholl Biogas Project approval and ready to deliver renewable energy in 2024
- Hypothetical projects integrated to the model:
 - 40 MW Geothermal, to be added in two installments
 - 20 MW Commercial Rooftop Solar paired with 10MW (2-Hr) BESS
 - 30 MW Grid Scale Solar paired with 20MW (4-Hr) BESS
 - 100 MW Wind, to be added in two installments
 - 25 MW Local Battery Storage added for a total of 75 MW (4-Hr) BESS by 2030; BESS beyond 75 MW is found to be ineffective.
 - SWAC line capacity increased from 100MW to 167MW in 2027 as part of the IPP Renewal

Based on the model, the total clean energy supply will significantly exceed the annual customer demand requirements due to the timing of electric demand and generation of renewable energy. Over procurement of renewable resources will mitigate the supply and demand coincidence constraint, resolve the intermittency of renewable resources, and optimize limited transmission capacity. The high level of uncertainty of variable resources in this portfolio triggers off-system sales and curtailments in some hours when generation exceeds the transmission capacity limits and customer load. Curtailments can go as high as 25% of retail load. This is expected given the high level of renewables added to the model and the fact that California is already experiencing large curtailments of solar energy.

Ensuring system reliability requires GWP to plan for sufficient, flexible and dependable capacity to meet 1-in-10 peak demand and obligatory reserve margin for resource adequacy and N-1-1 contingency. To address these requirements, reciprocating internal combustion engines (RICE) were retained in the study and would be used mainly to cover extreme load peaks, along with Grayson Unit 9 and local BESS. During a contingency event (specifically the loss of PDCI and/or STS transmission capacity), these resources provide critical capacity to avoid blackouts.

Overall, carbon emissions from the clean energy portfolio mix proposed in this study would be reduced by approximately 18% compared to the resulting emissions from the 2019 IRP portfolio. Emissions are attributed mainly to Magnolia and IPP must-run resources. Carbon emissions from running the RICE and Grayson Unit 9 are determined to be insignificant due to minimal run-time, as shown below.



IPP is planning to run on 30% hydrogen by volume (10% by energy content) starting in 2025, and move to 100% hydrogen by 2045. Potential emission reduction by partially running IPP on green hydrogen is excluded in the estimate. Furthermore, the retirement of Grayson Units 1-8 would significantly reduce local NOx pollution.

Conclusions

The study reveals that under the set of assumptions relied upon in the report, GWP could realistically serve 89% of Glendale’s retail load with clean energy around-the-clock by 2030. In order to move past 89%, GWP will need to have access to more transmission capacity so that it can add renewables and/or convert fossil fuel resources to run on renewable fuels like green hydrogen. As technology changes, GWP will be able to take advantage of additional clean resources through fuel conversions in thermal assets which will put GWP in a position to meet 100% of its energy needs with clean energy.

GWP will continue to monitor technology developments and will revisit this study as part of the next IRP release in 2024. A 100% Clean Energy scenario will become a standard part of the IRP analysis going forward.

FISCAL IMPACT

No fiscal impact to noting and filing this report.

Based on the broad assumptions used for future costs of hypothetical resources, the 2030 supply cost of the assembled portfolio in this study is somewhere between \$143 million to \$155 million, an increase of approximately \$60 million from 2022 supply cost. This results in an additional revenue requirement of approximately 4.1 cents per kWh, or roughly a 28% increase for ratepayers. A detailed cost of service analysis is needed to determine the full effects on rates.

ALTERNATIVES

Alternative 1: Adopt a motion to note and file the 100% Clean Energy by 2030 Report attached hereto as Exhibit 1.

Alternative 2: The City Council may consider any other alternative not proposed by staff.

CAMPAIGN DISCLOSURE

Not applicable.

EXHIBIT(S)

Exhibit 1: 100% Clean Energy by 2030 Report